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Golder Associates

August 4, 1993

Our ref: 913-1101.610

U.S. Environmental Protection Agency
Region 10, Hazardous Waste Division
1200 6th Avenue (HW-113)
Seattle, Washington 98101

ATTENTION: Mr. Timothy H. Brincefield

RE: EXPLANATION AND CORRECTIVE ACTION PLAN, FLUORIDE AND URANIUM RESULTS, MONSANTO CHEMICAL COMPANY, SODA SPRINGS, IDAHO

Dear Mr. Brincefield:

We are writing in response to your letter of July 23, 1993 to Mr. Robert Geddes regarding radionuclide and fluoride analyses. We have reviewed your oversight results and are addressing fluoride, radium-226 and uranium since these were specifically called out by Mr. James Eldridge of SAIC in his letter of July 12, 1993.

Radium-226 - All of the Monsanto comparison sample data were qualified as "U" or undetected due to associated positive method blank results. With regard to the differences in reporting of the Phase I and II soil sampling data, we have changed our procedures for reporting radiochemistry data in that error values are dropped from the result following validation since error values are not used in the risk assessment screening process.

Uranium - The results for uranium in surface soils are reported incorrectly as "total uranium" and are actually uranium-238. Uranium was determined by gamma spectrometric analysis for thorium-234 (uranium-238 daughter), a method that is not sufficiently sensitive for uranium-234 or uranium-235. We have performed additional comparison of the oversight and Monsanto results by calculation of uranium-234, 235 and total uranium results using theoretical ratios of the isotope activity levels. Our comparison is provided in Table 1 and is an evaluation of the average relative percent difference (RPD) between each result pair. We then compared the RPD values against our normal data validation criterion level of 35%. Average RPD values are acceptable for uranium-238 which was the only parameter measured by both Monsanto and the oversight laboratory. Average RPD values exceeded 35% for those parameters derived from theoretical activity percentages or the sum of measured and derived values. Discrepancies are likely due to the use of different analytical methods or measurement error at levels near the method detection limit. Since the uranium results were reported incorrectly we will provide a corrected copy of the data by August 13, 1993.

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Fluoride - The discrepancy between fluoride results is due to the oversight laboratory's use of different sample preparation method (Bellack distillation) as compared to our use of a water soluble preparation procedure, as specified and approved in the QAPjP (Golder 1991[1]). We believe the soluble analysis procedure is applicable as related to characterization of site soils for the following reasons:

- the likely exposure route from fluoride contained in surface soils would be by inhalation of soil particles containing soluble forms of fluoride
- the predominant forms of fluoride in surface soils near the plant site are likely insoluble calcium fluoride from the breakdown of phosphatic fertilizers and reaction of volatile forms of fluoride (HF, SiF_4).

Based on the above information we request approval to proceed with analysis of all additional control soil samples and stream sediment samples as planned for radionuclides and fluoride. If you have any questions concerning the enclosed information, please contact us.

Sincerely,

GOLDER ASSOCIATES INC.

Kent M. Angelos
Associate Environmental Scientist

David Banton
Project Director

KMA/DB/ln

Enclosures

cc: Bob Geddes, Monsanto
Bill Wright, Golder Associates
David Banton, Golder Associates
Mark Cunnane, Golder Associates
Dan Hrebenyk, Senes Consultants

[1]Golder 1991, Phase I Remedial Investigation/Feasibility Study Work Plan for the Soda Springs Elemental Phosphorus Plant, Report to Monsanto, Golder Associates Inc., Redmond, Washington.

TABLE 1
COMPARISON OF EPA AND MONSANTO URANIUM SPLIT SAMPLES
(results in pCi/g)
(Shaded boxes exceed the 35% RPD validation criterion)

SAMPLE ID	EPA U-234	MCC U-234 (*)	RPD	EPA U-235	MCC U-235 (*)	RPD	EPA U-238 (*)	MCC U-238	RPD	EPA TOT. U	MCC TOT. U (*)	RPD
MS2-1	1.16	1.2	3%	0.148	0.12	21%	1.3	1.2 U	8%	2.608	2.5	3%
MS2 (0-1")	9.7	1	163%	0.573	0.10	141%	9.44	1 U	162%	19.713	2.1	161%
MS2 (0-6")	1.09	0.52	71%	0.046	0.05	12%	0.803	0.52 U	43%	1.939	1.1	56%
MS2-3	3.57	3.2	11%	0.146	0.32	75%	3.43	3.2 U	7%	7.146	6.7	6%
MS2-4	1.98	2	1%	0.12	0.20	50%	2.03	2 U	1%	4.13	4.2	2%
MS2-5	2.18	2.8	25%	0.113	0.28	85%	2.02	2.8 U	32%	4.313	5.9	31%
MS2-6	1.132	1.6	34%	0.097	0.16	49%	1.46	1.6 U	9%	2.689	3.4	22%
MS2-7 (0-1")	7.37	6.2	17%	0.279	0.62	76%	7.47	6.2 U	19%	15.119	13.0	15%
MS2-7 (0-6")	2.48	3.4	31%	0.154	0.34	75%	2.64	3.4 U	25%	5.274	7.1	30%
MS2-7 (6-12")	1.6	2.1	27%	0.092	0.21	78%	1.6	2.1 U	27%	3.292	4.4	29%
MS2-8	1.28	3.5	93%	0.069	0.35	134%	1.31	3.5	91%	2.659	7.4	94%
MS2-9 (0-1")	1.62	2.1	26%	0.08	0.21	90%	1.77	2.1	17%	3.47	4.4	24%
MS2-9 (0-6")	1.31	1.5	14%	0.073	0.15	69%	1.25	1.5	18%	2.633	3.2	18%
MS2-9 (6-12")	0.185	1.5	156%	0.021	0.15	151%	0.981	1.5	42%	1.187	3.2	91%
MS2-10	1.39	1.7	20%	0.069	0.17	85%	1.4	1.7	19%	2.859	3.6	22%
AVG. RPD			46%			79%			35%			39%

(*) - Indicates a calculated value based on natural activity of 47.5% uranium-234, 0.05% uranium-235 and 47.5% uranium-238. Total uranium values are the sum of the individual isotope activities.

U - Indicates the constituent was analyzed for but not detected. The associated value is the sample minimum detectable activity.
RPD - Relative percent difference
EPA - U.S. Environmental Protection Agency, Region 10
MCC - Monsanto Chemical Company, Soda Springs, Idaho